D. 1645 . . . . . N° 11,260.

SPECIFICATION

OF

AMBROSE LORD.

FLUES AND FLUES OF STEAM BOILERS.

LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

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1854.

A.D. 1846 . . . . . N° 11,260.

Furnaces and Flues of Steam Boilers.

LORD'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, AMBROSE LORD, of Allerton, in the County of Chester, Toll Collector, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Twenty-fourth day of June, in the tenth year of Her reign, and in the year of our Lord One thousand eight hundred and forty-six, did, for Herself, Her heirs and successors, give and grant unto me, the said Ambrose Lord, Her especial licence, full power, sole privilege and authority, that I, the said Ambrose Lord, my executors, administrators, and assigns, and such others as I, the said Ambrose Lord, my executors, administrators, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England and Wales, and the Town of Berwick upon Tweed, my Invention of "CERTAIN IMPROVEMENTS IN FURNACES, AND THE FLUES OF STEAM BOILERS, FOR THE PURPOSES OF CONSUMING THE SMOKE AND ECONOMIZING THE FUEL;" in which said Letters Patent is contained a proviso, that I, the said Ambrose Lord, shall cause a particular description of the nature of my said Invention, and in what manner the same is to be performed, to be inrolled in Her Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Ambrose Lord, do hereby declare that the nature of my said Invention

and the manner in which the same is to be performed, is particularly described and ascertained in and by the Drawings hereto annexed; and the following explanation thereof (that is to say):—

My improvements in furnaces and the flues of steam boilers, for the purposes of consuming the smoke and economizing the fuel, consist in the application, employment, or use of two furnaces or sets of fire bars to each boiler, which are to be fed or supplied with coal alternately, and also in arranging or constructing the flues and regulating the dampers in such a manner that the smoke, gas, and other unconsumed combustible matter evolved from the fire that has been last fed shall pass under and through the other fire, which is to be at a clear red heat, and thus be consumed. When the fire which was last fed has attained a red heat, so as to give out no smoke, the dampers are to be reversed, which will reverse the draught. The other furnace or fire-place may then be fed or supplied with fuel, and the smoke and gas from it will pass under and through the clear red fire, and so on alternately. In order more clearly to explain my Invention, and the method of carrying the same into practical effect, I have attached to these Presents two Sheets of Drawings, Sheet 1 showing my improvements as applied to the boiler of an ordinary stationary steam engine, having two moveable grates, and Sheet 2 representing a boiler with two stationary grates. In Sheet 1, Figure 1 is an horizontal section; Figure 2, a vertical longitudinal section; and Figure 3 is an end view of a cylindrical boiler, with my improvements applied thereto. *a*, *a*, *a*, *a*, is the brickwork supporting the boiler *b*, *b*. This boiler *b* has two oval flues *c*, *c*, and *d*, *d*, extending through it from end to end. The lower flue *c*, *c*, is provided with rails *e*, *e*, upon which the moveable grates *f* and *g* run, being provided with wheels *h*, *h* *h*, *h*, for that purpose. It will be seen that the boiler *b* is provided with a water space *i*, *i*, about the centre, extending across the upper half of the flue *c*, *c*, and forming a bridge to direct the course of the smoke, &c., or a bridge formed of brickwork may be used; and the flue *c*, *c*, is provided with cross bars *k*, *k*, *k*, *k*, from which hang swing doors *l*, *l*, *l*, *l*, which when shut serve also to direct the passage of the smoke and gases, and which may be opened for the purpose of removing the ashes, &c.; *m* and *n* are two upright flues, each leading to the chimney, and *o*, *o*, are the fire doors, which must be provided with air valves for the purpose of regulating the draft. When it is desired to heat the boiler, both of the moveable grates *f* and *g* are brought towards the fire doors, and the fires lighted; all the dampers are then opened by placing the levers *p* and *q* (which work the dampers) in a perpendicular position, but as soon as one fire (say *g*,) has attained a clear red heat, it is to be pushed along the rails *e*, *e*, as far backwards as the bridge *i*, *i*, and the lever *q* pulled

outwards, which will open the damper *r*, and close the damper *s*, and by means of the rod *t*, and lever *p*, open the damper *u*, and close the damper *v*. The apparatus will then be in the position shewn in the Drawing, and the smoke and other combustible proceeding from the grate *f*, being guided by the swing doors *l*, *l*, and the bridge *i*, *i*, will pass under the furnace and through the clear red fire on the grate *g*, and thereby be consumed and converted into pure heat, thus effecting a great economy of the fuel. When the fire in the grate *f* has burnt clear, and the furnace requires a fresh supply of fuel, the grate *g* is drawn forward towards the fire doors and fed with fuel, and the grate *f* is pushed backwards close to the bridge *i*, *i*; the dampers are then reversed by means of either of the levers *p*, *q*, thus altering the direction of the current or draught through the flues, and causing the smoke, &c. evolved from the coal upon the grate *g* to pass under the furnace and through the clear fire in the grate *f*, and so on alternately. When it is desired to check the steam, it may readily be done by drawing both grates towards the fire doors, and opening or withdrawing all the dampers. Figure 4 is a transverse section shewing the application of my Invention to a waggon-shaped boiler, which having similar letters of reference to those on Figures 1, 2, and 3, is so obvious as to need no further description. In Sheet 2, Figure 1 is an horizontal section, and Figure 2 an end view of a cylindrical boiler, showing the application of my Invention, with two stationary grates. *a*, *a*, is the brickwork, and *b*, *b*, the boiler, which has two oval flues *c*, *c*, and *d*, *d*, extending through the same from end to end on a level with each other. The flues *c*, *c*, and *d*, *d*, contain the two stationary fire grates *e*, *e*, and *f*, *f*, one at each end of the boiler. It will be seen also that at each end of the of the boiler there is a flue *g*, *g**, connecting the ends of the two flues *c* and *d*, and that the fire doors *h*, *h**, (which must be furnished with air valves) are fixed in the flues *g*, *g**. These flues also communicate with the vents *i*, *i**, which lead to the chimney, and these vents *i*, *i**, are connected together by a flue (which is not seen in the Drawing) passing under the boiler. Now, supposing the fire grate *e* to have just received a fresh supply of fuel, and that upon the fire grate *f* to be burning at a clear red heat, then the damper *k**, in the flue *g**, must be opened by means of the lever *l**, which at the same time will close the damper *m**, communicating with the vent *i**, and the damper *n** in the vent *i** leading to the chimney must be closed. At the other end of the boiler the damper *m* must be opened, and the dampers *k* and *n* closed. The smoke from the newly fed fire *e*, will pass through the flue *c*, *c*, along the flue *g**, under and through the clear fire in the grate *f*, by which it will be consumed and converted into pure heat, which the draught of the chimney will cause to pass through the flue *d*, down the vent *i*, under the

boiler to the vent *i**, and thence to the chimney. When fresh fuel is supplied to the fire *f*, the dampers must be reversed, and of course the draught and consequently the passage of the smoke, heated air, &c. will be reversed also. I would here remark that although the flues in which the fire grates are placed are described as being oval, and also shewn in the Drawing as such, yet I do not intend to confine myself to that shape, although I would recommend its use, as allowing of a greater width of fire bars in the same circumference or area; nor do I claim as my Invention the use of two fire-grates to one boiler; but I do claim as my Invention, the application, employment, or use of two separate or distinct fire grates or furnaces (whether moveable or stationary) to one boiler, which are to be fed or supplied with fuel alternately, and which are to be connected together by flues regulated by dampers in such a manner that the smoke and other products of combustion evolved from the furnace or fire-place which was last fed or supplied with fuel, shall be caused to pass under the other furnace or fire-place, and upwards through the fire of the same, for the purposes of consuming the smoke and economizing the fuel.

In witness whereof, I have hereunto set my hand and seal, this Twenty-third day of December, One thousand eight hundred and forty-six.

AMBROSE (L.S.) LORD.

Wm Mawson, a Master Extraordinary in Chancery.

AND BE IT REMEMBERED, that on the same Twenty-third day of December, in the year above mentioned, the aforesaid Ambrose Lord came before our Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained, in form above written. And also the Specification was stamped according to the tenor of the Statute in that case made and provided.

Inrolled the Twenty-fourth day of December, in the year above written.

LONDON:
Printed by George Edward Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty. 1854.

A. D. 1846. June 24. N° 11260.
LORD'S Specification.

2 Sheets
Sheet 1

FIG. 1.

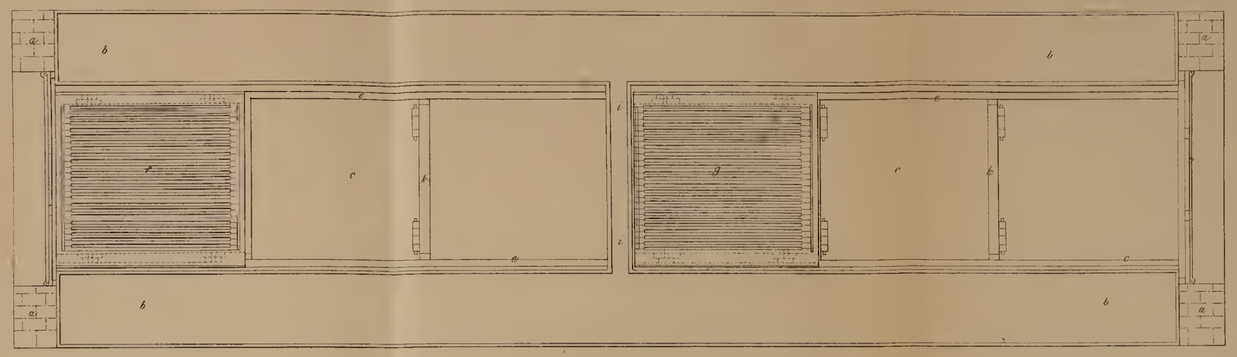


FIG. 4.

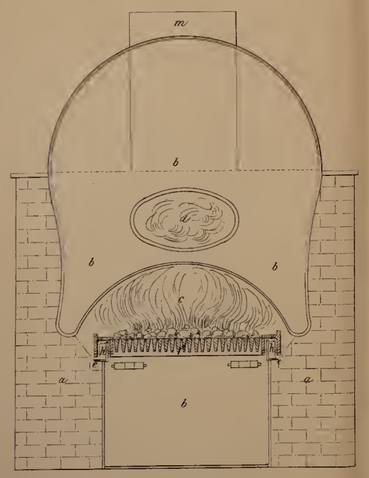


FIG. 2

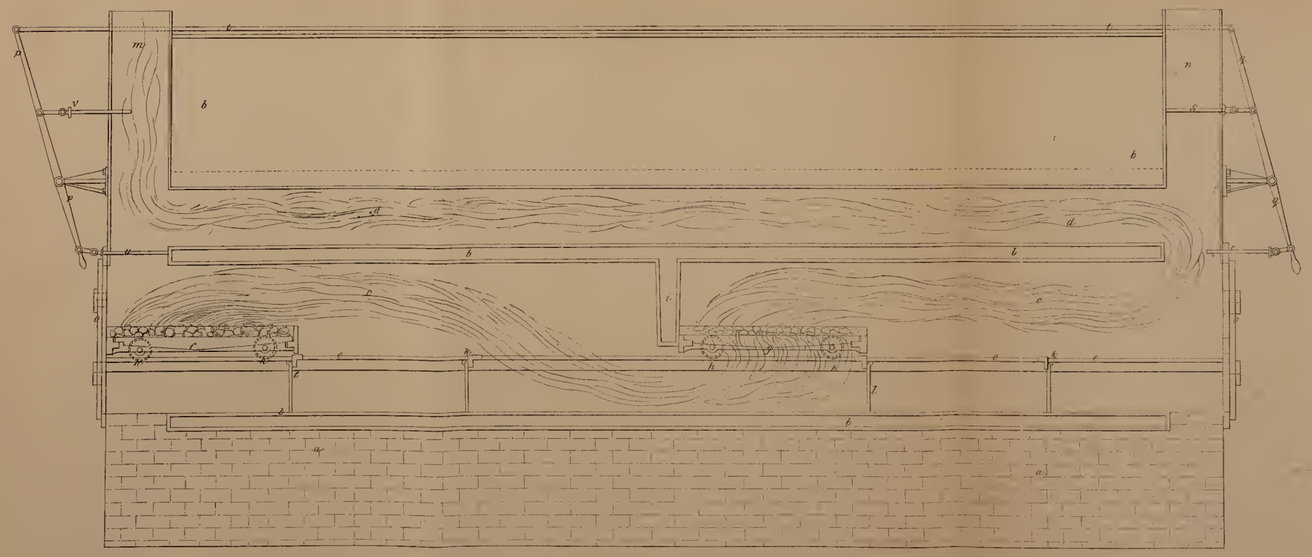
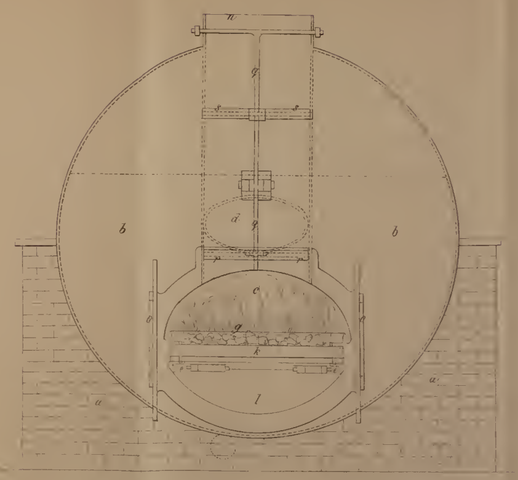


FIG. 3.



Scale

Inches. 12 8 0 1 2 3 4 1 2 3 10 11 1 Feet.

The Enrolled drawing is colored

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FIG. 1.

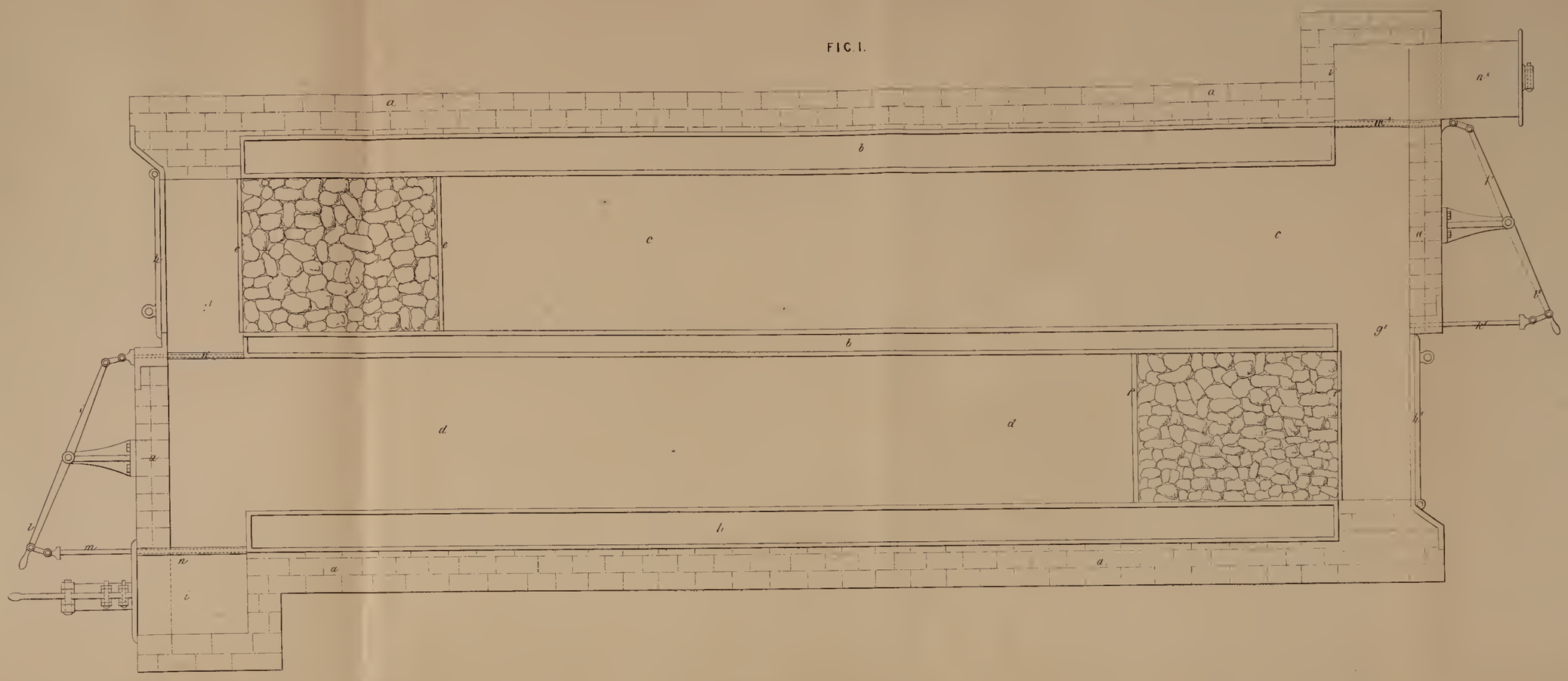
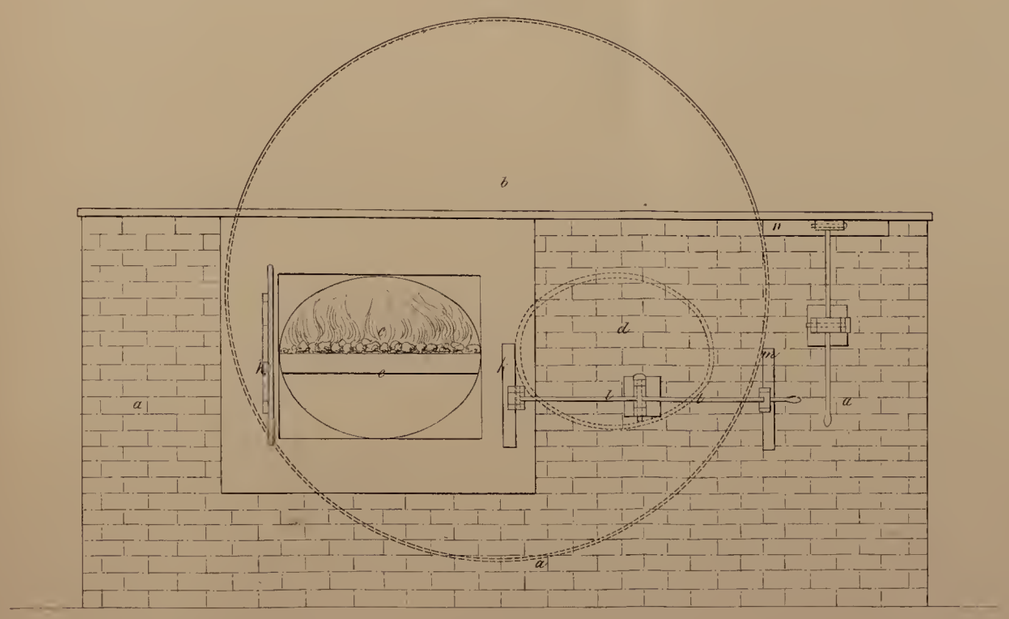


FIG. 2.



Scale.

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